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ABSTRACT

In 1989, Cochise College (CC) conducted a study to determine if a positive relationship existed between grade placement scores on the Nelson-Denny or Nelson reading comprehension examination and academic performance. The study population consisted of new or first-time CC students who were tested after May 1989. Placement scores for students who were tested in 1989 were joined with class grades for the fall 1989 term to create a data base of grades and reading placement scores. Major findings of the study were as follows: (1) a positive relationship did exist overall between placement scores on the Nelson-Denny exam and academic success, although a negative relationship existed in developmental classes; (2) students in the highest category of test scores (13+) had higher success rates in non-vocational courses than they did in vocational courses, while the opposite was true for students in the other categories; (3) students whose placement scores were grade 10 or above enrolled mainly in upper division classes, and students whose placement scores were below grade nine enrolled primarily in developmental classes; (4) the Nelson-Denny was a better predictor of success for traditional arts and sciences courses than for vocational courses; (5) most of the students who were tested in 1989 placed at grade 11 or better; and (6) the Nelson-Denny examination was not a good predictor of academic success at lower grade levels. Appendixes providing grades by placement scores and other student data are attached. (JMC)

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ED317236

A REPORT ON READING COMPREHENSION AND ACADEMIC SUCCESS

IC900185

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COCHISE COLLEGE
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February 1990

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1. PURPOSE

The purpose of this study was to determine if a positive relationship existed between grade placement scores on the Nelson-Denny or Nelson reading comprehension exam and academic performance.

2. DEFINITIONS

The following definitions apply to this study.

Developmental Courses: Courses numbered below 100.
Involuntary Withdrawal: A grade of "W" or "WF".
Upper Division Courses: Courses numbered 100 or above (100+).
Vocational Courses: Courses related or a part of occupational programs.
Placement Score(s): The reading comprehension grade level as determined by the Nelson-Denny reading exam.
Success Rate: The percentage of grades at "C" or above.

3. LIMITATIONS

The outcomes of this study may be limited by the following factors.

1. Physical Education classes were not included.
2. Placement scores below grade five were not included.
3. The population was limited to students who were tested in 1989.
4. No distinction was made between full time and part time students.

4. ASSUMPTIONS

The following assumptions apply.

1. The students who were tested in 1989 were new or first time students to Cochise College.
2. The few (9%) students who were tested prior to May 1989 did not significantly affect the outcomes of this study.

3. The abnormalities found in grade levels 5 & 6 were caused by test inconsistencies and in some cases individual efforts.

4. All faculty have comparable grading standards.

5. **METHODOLOGY**

Placement scores for students who were tested in 1989 were joined with their class grades for the fall 1989 term to create a data base of grades and reading placement scores.

Students and classes were categorized by placement scores and by type of class.

Total Students		484*
1. Grade 13 and above (13+) . . .	38%	
2. Grades 11 & 12	26%	
3. Grades 9 & 10	19%	
4. Grades 7 & 8	10%	
5. Grades 5 & 6	7%	
Total Grades		1545*
1. Upper Division: 100 level and above (100+)	64%	
Vocational	26%	
Non-vocational	74%	
2. Developmental	36%	

* Excludes placement scores below grade five.

The number of class grades (A - WF) were counted for each type of class by grade level to determine the success rate for each grade level in that type of class See appendices I,II for details.

6. **SUMMARY OF FINDINGS**

1. A positive relationship does exist between placement scores on the Nelson-Denny exam and academic success. Students who scored highest on the Nelson-Denny exam had higher success rates in all of their classes than those who scored the lowest. A negative relationship exists, however, in developmental classes.

Students with high placement scores not only had lower success rates in developmental classes than students with lower placement scores, but they were much more likely to involuntary withdraw (W or WF) from the class.

2. Students in the highest category (13+) had higher success rates in non-vocational courses than they did in vocational courses. For the other categories, the opposite was true. Also, students in the 13+ category were more likely to involuntary withdraw from vocational courses than students in the other categories.

3. Students whose placement scores were grade 10 or above enrolled mainly in upper division classes, and students whose placement scores were below grade nine enrolled primarily in developmental classes. Grades nine and ten were the crossover point; about one-half of this category enrolled in upper division classes and the other half enrolled in lower division classes.

4. At the higher grade levels, BUS, CIS, and OED were the most heavily enrolled vocational classes. At the lower grade levels, AGR, BUS, and OED were the most popular. Some of the more noticeable enrollment changes going down the scale from grades 13+ to grades 7 & 8 were:

AGR	increased	6.7%
AJS	increased	6.3%
BUS	decreased	3.0%
CIS	decreased	17.4%
OED	increased	13.8%

5. The Nelson-Denny is a better predictor of success for traditional arts and sciences courses than for vocational courses.

6. Most of the students who were tested in 1989 placed at grade 11 or better.

7. **ANALYSIS**

Upper Division and Developmental Grades

A positive relationship does exist between reading placement scores on the Nelson-Denny exam and academic success at Cochise College. The higher grade level one tested at on the Nelson-Denny, the better the chances were that the student would earn a "C" or better, and the chances were less that the student would involuntary withdraw from a course. During the fall 1989 term, of the 484 students whose placement scores and end-of-course grades were used for this study, over three-fourths of the students who tested at grade 13 or higher achieved academic success and only 11% of them involuntary withdrew from their classes. This contrasts sharply with the academic performance of the students whose test scores placed them at the lower grades. At grades seven and eight, slightly under two-thirds of the students earned a grade of "C" or better, and slightly less than a quarter of them (23%) received grades of "W" or "WF". However, there was a distinct difference between the grades earned in upper division and developmental classes.

For reasons unexplained by quantitative analyses, students who tested at the higher grade levels were less successful in developmental classes than they were in upper division classes, and they were much more likely to involuntary withdraw from a developmental class than from a upper division class. Well over 80% of the students who tested at grades 13 and above were

successful in upper division work compared to a 66% success rate in developmental work. Also, a sizable share of them (21%) involuntary withdrew from their developmental classes compared to a 9% dropout rate in the upper division classes. At the lower end of the scale, however, students who tested at grades seven and eight did much better in developmental classes than they did in upper division classes. Over two-thirds (69%) of this cohort were successful in developmental work compared to a 59% success rate in upper division work. The following table shows the success rates and withdrawal rates for each grade in upper division and developmental classes.

Table 1
SUCCESS RATES
and
INVOLUNTARY WITHDRAWALS
Upper Division and Developmental Classes
Fall 1989

Grade Level	Success Rates		Involuntary Withdrawals	
	Upper Division	Developmental	Upper Division	Developmental
13 +	81.9%	66.3%	9.1%	21.3%
11 - 12	77.5	62.3	8.1	26.3
9 - 10	67.3	77.9	15.7	9.2
7 - 8	58.9	68.6	23.2	23.0
5 - 6	79.4	73.8	5.9	13.1
All Students	75.6	71.4	10.5	20.2

Vocational and Non-vocational Grades

Although Table 1 indicates that the Nelson-Denny exam is a good predictor of academic success, the exam is a better predictor of success in traditional arts and science classes than for vocational classes. In vocational classes, students who

tested at the highest grade levels were less successful than those who tested at lower grade levels. This is not to say that students who tested at grade 13 or above were unsuccessful in their vocational classes. They were quite successful; however, students who tested at lower grade levels were a bit more successful. Despite their having a 74% success rate in vocational classes, students with placement scores at grades 13 or above were outdone by those at grades seven and eight by a margin of 3%. Students at the lower grade levels, however, were less persistent than those at the higher grade levels. Their involuntary withdrawal rate was 27% for non-vocational classes and 19% for vocational classes compared to 10% dropout rate for those at the upper grades in both vocational and non-vocational classes. The next table shows the success and persistence rates for vocational and non-vocational classes by grade levels.

Table 2
SUCCESS RATES
and
INVOLUNTARY WITHDRAWALS
Vocational and Non Vocational Classes
Fall 1989

	Success Rates		Involuntary Withdrawals	
Grade Level	Vocational	Non-Vocational	Vocational	Non-Vocational
13 +	73.8%	80.3%	10.1%	8.9%
11 - 12	79.4	77.1	11.0	9.1
9 - 10	69.0	66.0	12.7	18.2
7 - 8	77.0	43.3	19.2	26.7
5 - 6	79.4	80.0	10.5	0.0
All Students	74.8	75.9	12.1	10.0

Grade 5 and 6 inconsistencies

Both Tables 1 and 2 show that students who tested at grades five and six not only did much better than their test scores indicated they should, but they outperformed some students at the upper grade levels. Their overall success rate was more than 75%, and their involuntary withdrawal rate was 11%. Likewise, in the non-vocational area, their success rate of 80% paralleled that of the 13+ group. Why? Possibly:

1. A small population,
2. Incorrect scoring,
3. ESL backgrounds, or
4. Test anxiety.

With small populations, a slight increase or decrease in the population will result in a rather large percentage change. Since this particular population consisted of only 34 upper division class grades, of which the majority were in vocational courses, the small number of "C" or better grades earned by this group would show a higher than expected success rate. Also, in two transcripts, there some evidence of incorrect scoring or test anxiety.

Two students whose placement scores were grades 5.7 and 5.8 respectively had much higher than expected semester GPAs. In non-vocational courses, the first student earned a "B" in ENG 100 and a "C" in MAT 120 as well as a "B" in ELT 106. The second student earned a "B" in ENG 101 and PSY 101, an "A" in ENG 110 and MAT 110, as well as an "A" in CIS 172. Normally, this type of performance is not expected from students who read at the 5th

grade level. Additionally, one-third of the non-vocational grades were earned in classes designated for ESL students --ENG 106. It goes without saying then that this particular population is not representative of students whose reading comprehension is at grade six or below, and their success rates should not be considered normal for other low scoring populations.

7. CONCLUSIONS

This study concluded the following:

1. There is a positive relationship between reading grade placement scores attained on the Nelson-Denny exam and academic success; however, the relationship is more positive in non-vocational courses than in vocational courses.

2. The Nelson-Denny exam is not a good predictor of academic success at lower grade levels e.g. grade six and below.

8. RECOMMENDATINS

The following recommendation is made:

1. The academic success of the students who tested at grades 10 and below be monitored for the next four semesters to determine the impact of remedial programs on student success and outcomes.

APPENDIX I

Upper Division and Developmental Grades by Placement Score

GRADE 13 & ABOVE

Upper Division: 84.0%
Developmental 16.0%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	150	35.8%	27	33.8%	177	35.5%
B	119	28.4%	16	20.0%	135	27.1%
C	63	15.0%	10	12.5%	73	14.6%
D	18	4.3%	6	7.5%	24	4.8%
F	23	5.5%	1	1.3%	24	4.8%
I	8	1.9%	3	3.8%	11	2.2%
P	0	0.0%	0	0.0%	0	0.0%
W	34	8.1%	17	21.3%	51	10.2%
WF	4	1.0%		0.0%	4	0.8%
TOTAL	419		80		499	

GRADES 11 & 12

Upper Division: 84.0%
Developmental 16.0%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	85	27.2%	13	21.3%	98	26.3%
B	84	26.9%	15	24.6%	99	26.5%
C	73	23.4%	10	16.4%	83	22.3%
D	29	9.3%	5	8.2%	34	9.1%
F	12	3.8%	2	3.3%	14	3.8%
I	4	1.3%	0	0.0%	4	1.1%
P	0	0.0%	0	0.0%	0	0.0%
W	22	7.1%	12	19.7%	34	9.1%
WF	3	1.0%	4	6.6%	7	1.9%
TOTAL	312		61		373	

GRADES 9 & 10

Upper Division: 50.0%
Developmental 49.7%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	32	19.4%	49	30.1%	81	24.7%
B	44	26.7%	39	23.9%	83	25.3%
C	35	21.2%	39	23.9%	74	22.6%
D	14	8.5%	12	7.4%	26	7.9%
F	10	6.1%	8	4.9%	18	5.5%
I	4	2.4%	1	0.6%	5	1.5%
P	0	0.0%	0	0.0%	0	0.0%
W	23	13.9%	13	8.0%	36	11.0%
WF	3	1.8%	2	1.2%	5	1.5%
TOTAL	165		163		328	

GRADES 7 & 8

Upper Division: 27.5%
Developmental 72.5%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	12	21.4%	27	18.2%	39	19.1%
B	9	16.1%	44	29.7%	53	26.0%
C	12	21.4%	31	20.9%	43	21.1%
D	6	10.7%	9	6.1%	15	7.4%
F	4	7.1%	1	0.7%	5	2.5%
I		0.0%	2	1.4%	2	1.0%
P		0.0%		0.0%		0.0%
W	11	19.6%	30	20.3%	41	20.1%
WF	2	3.6%	4	2.7%	6	2.9%
TOTAL	56		148		204	

GRADES 5 & 6

Upper Division: 24.1%
Developmental 75.9%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	8	23.5%	28	26.2%	36	25.5%
B	11	32.4%	27	25.2%	38	27.0%
C	8	23.5%	24	22.4%	32	22.7%
D	4	11.8%	11	10.3%	15	10.6%
F	0	0.0%	2	1.9%	2	1.4%
I	1	2.9%	1	0.9%	2	1.4%
P	0	0.0%	0	0.0%	0	0.0%
W	2	5.9%	14	13.1%	16	11.3%
WF	0	0.0%	0	0.0%	0	0.0%
TOTAL	34		107		141	

ALL STUDENTS

Upper Division: 63.8%
Developmental 36.2%

	Upper Division		Developmental		Total	
Grade	Number	Percent	Number	Percent	Number	Percent
A	287	29.1%	144	25.8%	431	27.9%
B	267	27.1%	141	25.2%	408	26.4%
C	191	19.4%	114	20.4%	305	19.7%
D	71	7.2%	43	7.7%	114	7.4%
F	49	5.0%	14	2.5%	63	4.1%
I	17	1.7%	7	1.3%	24	1.6%
P	0	0.0%	0	0.0%	0	0.0%
W	92	9.3%	86	15.4%	178	11.5%
WF	12	1.2%	10	1.8%	22	1.4%
TOTAL	986		559		1545	

APPENDIX II

Vocational and Non Vocational Grades by Placement Score

GRADE 13 & ABOVE

Vocational 16.5%
Non-vocational 83.5%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	31	44.9%	119	34.0%
B	15	21.7%	104	29.7%
C	5	7.2%	58	16.6%
D	3	4.3%	15	4.3%
F	5	7.2%	18	5.1%
I	3	4.3%	5	1.4%
P	0	0.0%	0	0.0%
W	6	8.7%	28	8.0%
WF	1	1.4%	3	0.9%
TOTAL	69		350	

GRADES 11 & 12

Vocational 23.4%
Non-vocational 76.6%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	33	45.2%	52	21.8%
B	15	20.5%	69	28.9%
C	10	13.7%	63	26.4%
D	5	6.8%	24	10.0%
F	2	2.7%	10	4.2%
I	0	0.0%	4	1.7%
P	0	0.0%	0	0.0%
W	7	9.6%	15	6.3%
WF	1	1.4%	2	0.8%
TOTAL	73		239	

GRADES 9 & 10

Vocational 43.0%
Non-vocational 57.0%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	26	36.6%	6	6.4%
B	10	14.1%	34	36.2%
C	13	18.3%	22	23.4%
D	4	5.6%	10	10.6%
F	7	9.9%	3	3.2%
I	2	2.8%	2	2.1%
P	0	0.0%	0	0.0%
W	9	12.7%	14	14.9%
WF	0	0.0%	3	3.2%
TOTAL	71		94	

GRADES 7 & 8

Vocational 46.4%
Non-vocational 53.6%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	8	30.8%	4	13.3%
B	6	23.1%	3	10.0%
C	6	23.1%	6	20.0%
D	1	3.8%	5	16.7%
F	0	0.0%	4	13.3%
I	0	0.0%	0	0.0%
P	0	0.0%	0	0.0%
W	3	11.5%	8	26.7%
WF	2	7.7%	0	0.0%
TOTAL	26		30	

GRADES 5 & 6

Vocational	55.9%
Non-vocational	44.1%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	5	26.3%	3	20.0%
B	5	26.3%	6	40.0%
C	5	26.3%	3	20.0%
D	2	10.5%	2	13.3%
F	0	0.0%	0	0.0%
I	0	0.0%	1	6.7%
P	0	0.0%	0	0.0%
W	2	10.5%	0	0.0%
WF	0	0.0%	0	0.0%
TOTAL	19		15	

ALL STUDENTS

Vocational	26.2%
Non-vocational	73.8%

	Vocational		Non-Vocational	
Grade	Number	Percent	Number	Percent
A	103	39.9%	184	25.3%
B	51	19.8%	216	29.7%
C	39	15.1%	152	20.9%
D	15	5.8%	56	7.7%
F	14	5.4%	35	4.8%
I	5	1.9%	12	1.6%
P	0	0.0%	0	0.0%
W	27	10.5%	65	8.9%
WF	4	1.6%	8	1.1%
TOTAL	258		728	

APPENDIX III

STUDENTS TESTED BY MONTH

Test Month	Number Students	Test Month	Number Students
JAN	0	JUL	18
FEB	1	AUG	414
MAR	4	SEP	8
APR	44	OCT	14
MAY	18	NOV	0
JUN	9	DEC	2
TOTAL		532*	

Note: * Includes test scores below grade 5.

VOCATIONAL CLASSES BY GRADE LEVEL

Class	13+	11 & 12	9 & 10	7 & 8	5 & 6	TOTAL
AGR	8.7%	5.5%	9.9%	15.4%	15.8%	9.3%
AJS	1.4%	2.7%	7.0%	7.7%	0.0%	3.9%
AVN	2.9%	0.0%	1.4%	0.0%	0.0%	1.2%
BUS	14.5%	8.2%	9.9%	11.5%	10.5%	10.9%
CED	1.4%	5.5%	5.6%	3.8%	0.0%	3.9%
CIS	17.4%	16.4%	11.3%	0.0%	5.3%	12.8%
DFT	2.9%	0.0%	1.4%	0.0%	0.0%	1.2%
ELT	7.2%	6.8%	5.6%	0.0%	5.3%	5.8%
EMT	1.4%	1.4%	0.0%	0.0%	0.0%	0.8%
GTC	0.0%	0.0%	1.4%	0.0%	0.0%	0.4%
MAC	0.0%	1.4%	0.0%	3.8%	0.0%	0.8%
NUR	0.0%	2.7%	0.0%	0.0%	0.0%	0.8%
OED	36.2%	45.2%	46.5%	50.0%	63.2%	45.0%
SSV	2.9%	0.0%	0.0%	3.8%	0.0%	1.2%
WLD	2.9%	4.1%	0.0%	3.8%	0.0%	2.3%

Nelson-Denny Students
(vs)
All Students: Fall 1989

Grades	All Students	Tested Students	Percent Variance
A	37.1%	27.9%	9.2%
B	24.7%	26.4%	-1.7%
C	14.2%	19.7%	-5.5%
D	4.2%	7.4%	-3.1%
F	3.6%	4.1%	-0.4%
I	1.5%	1.6%	-0.1%
P	0.1%	0.0%	0.1%
U	0.5%	0.0%	0.5%
W	13.2%	11.5%	1.7%
WF	0.8%	1.4%	-0.6%
Estimated GPA *	2.61	2.41	

* Excludes 1. Grades in PED
2. Placement scores below grade five.